

REMARKS

Claims 5-40 are pending in the application. Claims 9, 10, 13, 15 and 27-37 have been cancelled by this amendment. Therefore, claims 5-8, 11, 12, 14, 16-26, and 38-40 are at issue.

Claim 5 has been amended, and support for the amendment to claim 5 can be found in previously filed claims 9, 10, 13, and 15. Claim 5 now recites a spot joining device having a substantially L-shaped frame to which the joining tool and the receiving member are mounted.

Claims 5, 13, 16, 18-23, 27-29, 32-34 and 36-39 stand rejected under 35 U.S.C. §102(b) as being anticipated by Heideman et al U.S. Patent No. 6,053,391 ('391). Claims 18, 24-27, 30, 31, 35, 39 and 40 stand rejected under 35 U.S.C. §102(b) as being anticipated by White et al. U.S. Patent No. 6,247,633 ('633). Claims 4-15, 27, 30, 31 and 35 stand rejected under 35 U.S.C. §102(e) as being anticipated by Thompson U.S. Patent No. 6,302,315 ('315). In view of the amendments to claim 5, and for the reasons set forth below, it is submitted that these rejections are in error and should be withdrawn.

With respect to a spot joining device recited in claims 5-8, 11, 12, 14, 16 and 17, in the spot joining device recited in independent claim 5, the rotatable joining tool for friction agitating is provided on the upper portion of the frame having a substantially L-shape in a side view so as to be movable upwardly and downwardly, and the receiving member for receiving works to be joined is provided in the tip end portion of the lower side of the substantially-shaped frame as opposed to the joining tool. With this configuration, when the spot joining device is used as a spot joining gun by attaching the spot joining device on a polyarticular robot at its wrist, the spot joining device is positioned such that the receiving member receives a joint spot of works to be joined, and the joining tool then is made to move forward while rotating, friction-agitate the joint spot for the works to be joined, and move backward, thereby allowing the joint spot to be spot joined. In this case, because the side shape of the frame is substantially L-shaped, the joining tool and the receiving member for the works to be joined can be provided so as to be opposite to each other in one frame with a simple configuration. Further, because the joining tool and the receiving member for the

works to be joined are provided so as to be opposite to each other in one frame, the spot joining device easily can be moved to, and perform a joining operation at, a number of joint spots on the works to be joined. Even further, because the joining tool moves forwardly and backwardly with respect to the works to be joined that are received by the receiving member, it is not necessary to move the works to be joined. Thereby, joining operation can be performed easily and economically.

However, not one of the cited references discloses a substantially L-shaped frame on which the joining tool and the receiving member are provided. Although the '315 patent discloses a frame, the joining tool and the receiving tool are mounted on different frames.

Therefore, the spot joining device recited in claims 5-8, 11, 12, 14, 16 and 17 neither anticipated by, nor obvious, over any of the '391, '633 or '315 patents.

With respect to method claims 18-25 and the outer plate claim 26, in both the '391 and '633 patents, the shoulder only is in contact with the upper surface of the works, but not inserted thereinto, in contrast to the presently claimed invention.

More specifically, the '391 patent (col. 5, lines 57-62) discloses:

"Pin 14 is slowly **plunged into** the joint line **until shoulder 8 of stir weld tool 10 contact the surface of the work pieces**. At this stage there is a substantial amount of plasticized metal in a column about rotating pin 14 beneath shoulder of stir weld tool 10." (emphasis added)

Also, the '391 patent (col. 5, lines 57-62) discloses:

"Pin 14 is then moved relative to the work pieces along the line of the weld joint while maintaining a downward force on stir weld tool 10 **with the should 18 in contact with the surface of the work pieces**." (emphasis added)

As apparent from these descriptions, in the '391 patent, pin 14 moves to the surface of the work pieces in parallel thereto, while shoulder 18 is in contact with the surface of the work pieces. Therefore, the shoulder is not inserted into the work pieces. Further, as described in the '391 patent (col. 4, lines 13-16), Figure 4 shows the "**area of mixed metal material**" of

the work pieces formed by stirring by the pin 14 but not in the "**concave portion**" of the work pieces at all. Even further, the "**area of mixed metal material**" of Fig. 4, is formed by only the pin 14, but not by both pin 14 and shoulder 18. This is obvious from the above description, the shapes of the pin 14 and the shoulder 18, and the fact that there exists no shape that corresponds to the shape of the lower end portion of the shoulder 18 in the upper portion of the "area of mixed metal material in Fig. 4."

In the '633 patent, as apparent from the description (col. 2, lines 59-62):

"Pin 27 is extendable out of body 24, as shown by dotted outline in Fig. 2, while shoulder 25 maintains spinning contact with member 11 as the material of member 11,"

and from the column shape of the channels 15 of the member material friction stirred as shown in Fig. 1, the shoulder 25 is not inserted into the works at all.

Fig. 2 in the '633 patent shows the "**channels 15**" of Fig. 1. The "**channels 15**" are, as apparent from the description, "The weld consists of one or more **cannels 15 of member material that has been friction stirred**" (col. 2, lines 26-28), **a region of the works made of friction stirred member material** but not a "concave recess" of the works at all. Further the "**channels 15**" of Figs. 1 and 2 in the '633 patent are formed only by pin 27, but not both of the pin 27 and the shoulder 25.

The '315 patent neither discloses nor suggests that the shoulder portion is inserted into the work, in contrast to the presently claimed invention. Accordingly, the spot joining method recited in claims 18-25 and the outer plate recited in claim 26 are neither anticipated by nor obvious by any of the '391, '633 and '315 patents.

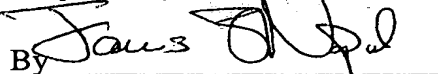
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It is submitted that the present claims are now in proper form and scope for allowance. An early and favorable action on the merits is respectfully requested.

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Respectfully submitted

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